

WHAT IS CLAIMED IS:

1. A perpendicular magnetic recording head comprising:
  - a main magnetic layer;
  - 5 an auxiliary magnetic layer separated from the main magnetic layer at a medium-opposing face of the perpendicular magnetic recording head opposing a recording medium; and
  - a coil layer disposed behind the medium-opposing face in the height direction to supply a recording magnetic field to
  - 10 the main magnetic layer and the auxiliary magnetic layer,
  - wherein the perpendicular magnetic recording head records magnetic data on the recording medium with a perpendicular magnetic field that concentrates on the main magnetic layer, and
  - 15 wherein inclined faces or curved faces are provided on both sides in the track width direction of the auxiliary magnetic layer so that the width of the auxiliary magnetic layer in the track width direction gradually increases in the height direction from a front end face close to the medium-
  - 20 opposing face.

2. A perpendicular magnetic recording head comprising:
  - a main magnetic layer;
  - an auxiliary magnetic layer separated from the main
  - 25 magnetic layer at a medium-opposing face of the perpendicular magnetic recording head opposing a recording medium;
  - a coil layer disposed behind the medium-opposing face in the height direction to supply a recording magnetic field to

the main magnetic layer and the auxiliary magnetic layer; and  
a light shield layer disposed on the main magnetic layer  
with an insulating layer therebetween,

wherein the perpendicular magnetic recording head  
5 records magnetic data on the recording medium with a  
perpendicular magnetic field that concentrates on the main  
magnetic layer, and

wherein at least one of the auxiliary magnetic layer and  
the light shield layer has inclined faces or curved faces on  
10 both sides in the track width direction so that the width  
thereof in the track width direction gradually increases in  
the height direction from a front end face close to the  
medium-opposing face.

15 3. A perpendicular magnetic recording head according to  
claim 1, wherein the inclined faces connect the front end  
face to side faces extending rearward in the height direction  
on both sides in the track width direction of the auxiliary  
magnetic layer.

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4. A perpendicular magnetic recording head according to  
claim 1, wherein the curved faces connect the front end face  
to side faces extending rearward in the height direction on  
both sides in the track width direction of the auxiliary  
25 magnetic layer, and are convex toward the medium-opposing  
face from imaginary planes that connect side ends in the  
track width direction of the front end face to leading ends  
of the side faces close to the medium-opposing face.

5. A perpendicular magnetic recording head according to claim 1, wherein the front end face is exposed from the medium-opposing face.

5        6. A perpendicular magnetic recording head according to claim 1, wherein the front end face is recessed in parallel from the medium-opposing face in the height direction.

7. A perpendicular magnetic recording head according to  
10 claim 2, wherein the inclined faces connect the front end face to side faces extending rearward in the height direction on both sides in the track width direction of said at least one of the auxiliary magnetic layer and the light shield layer.

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8. A perpendicular magnetic recording head according to claim 2, wherein the curved faces connect the front end face to side faces extending rearward in the height direction on both sides in the track width direction of said at least one  
20 of the auxiliary magnetic layer, and are convex toward the medium-opposing face from imaginary planes that connect side ends in the track width direction of the front end face to leading ends of the side faces close to the medium-opposing face.

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9. A perpendicular magnetic recording head according to claim 2, wherein the front end face is exposed from the medium-opposing face.

10. A perpendicular magnetic recording head according to claim 2, wherein the front end face is recessed in parallel from the medium-opposing face in the height direction.

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11. A perpendicular magnetic recording head comprising:  
a main magnetic layer;

an auxiliary magnetic layer separated from the main magnetic layer at a medium-opposing face of the perpendicular magnetic recording head opposing a recording medium; and

a coil layer disposed behind the medium-opposing face in the height direction to supply a recording magnetic field to the main magnetic layer and the auxiliary magnetic layer,

wherein the perpendicular magnetic recording head  
15 records magnetic data on the recording medium with a perpendicular magnetic field that concentrates on the main magnetic layer, and

wherein the auxiliary magnetic layer comprises:

a front end face curved at the medium-opposing face so  
20 that the width in the track width direction of the auxiliary magnetic layer increases in the height direction from the medium-opposing face; and

side faces extending rearward in the height direction from base ends of the front end face on both sides in the  
25 track width direction.

12. A perpendicular magnetic recording head comprising:  
a main magnetic layer;

an auxiliary magnetic layer separated from the main magnetic layer at a medium-opposing face of the perpendicular magnetic recording head opposing a recording medium;

5 a coil layer disposed behind the medium-opposing face in the height direction to supply a recording magnetic field to the main magnetic layer and the auxiliary magnetic layer; and

a light shield layer disposed on the main magnetic layer with an insulating layer therebetween,

wherein the perpendicular magnetic recording head  
10 records magnetic data on the recording medium with a perpendicular magnetic field that concentrates on the main magnetic layer, and

wherein at least one of the auxiliary magnetic layer and the light shield layer comprises:

15 a front end face curved at the medium-opposing face so that the width in the track width direction of said at least one of the auxiliary magnetic layer and the light shield layer increases in the height direction from the medium-opposing face; and

20 side faces extending rearward in the height direction from base ends of the front end face on both sides in the track width direction.